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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,894	06/27/2003	Tracy A. Gast	FSI0099/US	7801
33072	7590	08/02/2006	EXAMINER	
KAGAN BINDER, PLLC SUITE 200, MAPLE ISLAND BUILDING 221 MAIN STREET NORTH STILLWATER, MN 55082			CARRILLO, BIBI SHARIDAN	
			ART UNIT	PAPER NUMBER
			1746	

DATE MAILED: 08/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/608,894		GAST ET AL.	
	Examiner		Art Unit	
	Sharidan Carrillo		1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 21-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-29 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 9, 12-14 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Kamikawa et al. (5940985).

Kamikawa et al. teach a method of drying a wafer comprising: immersing the wafer into a vessel, separating the wafer from the liquid bath by replacing the liquid with a gas environment (i.e. N₂, IPA, Fig. 13/14) adjacent the surface of the wafer, delivering a cleaning enhancement substance at an interface between the surface of the wafer and the liquid bath, wherein the delivery of the cleaning enhancement substance is varied during the replacing step (col. 13, lines 25-52, col. 17-18 bridging). Kamikawa does not specifically recite causing a concentration gradient of said cleaning enhancement substance. However, the limitations are inherently met since Kamikawa is performing the same method steps as the instantly claimed invention. Additionally, col. 17, lines 59-62 teaches a Maragoni effect. It is well known in the art that a Maragoni effect produces a concentration gradient. Re claim 9, refer to col. 17-18 bridging. Re claims 12 and 14, refer to col. 13, lines 49-52. Re claim 13, refer to col. 13, lines 40-42. Re claim 17, col. 17-18 bridging teaches varying the concentration of the IPA during the drying step.

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-2 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Christenson et al. (2004/0050405).

Christenson et al. teach a method of drying a wafer comprising: immersing the wafer into a vessel, separating the wafer from the liquid bath by replacing the liquid with a gas environment (i.e. N₂, IPA) adjacent the surface of the wafer, delivering a cleaning enhancement substance at an interface between the surface of the wafer and the liquid bath, wherein the delivery of the cleaning enhancement substance is varied during the replacing step (paragraphs 9-11, 14-16, 42, 47). In reference to claim 2, refer to paragraph 50 which teaches the adjustment of the flowrate. Re claim 9, paragraph 52 teaches controlling the cleaning enhancement concentration profile along the meniscus. The limitations of varying the concentration from a first to a second concentration are inherently met since controlling the concentration of the cleaning enhancement profile would require a change in the concentration from a first concentration to a second concentration.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 10-11 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamikawa et al. (5940985).

Kamikawa teaches IPA and nitrogen gas. Kamikawa does not teach the

concentration of the nitrogen gas. It would have been within the level of the skilled artisan to determine the amount of carrier gas needed to deliver the cleaning enhancement substance to the substrate surface. Re claim 11, refer to Fig. 14, col. 9, lines 18-20. Re claim 15, it would have been obvious to a skilled artisan to have modified the method of Kamikawa, to include quick dumping since Kamikawa teaches the desire to remove the processing liquid and further teaches draining the processing liquid. Re claim 16, refer to col. 17-18 bridging.

9. Claims 3-8 and 10-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christenson et al. (US2004/0050405).

Christenson teach the invention substantially as claimed as recited in paragraph 4 above. Re claims 3-4 and 18-20, it would have been obvious to the skilled artisan to vary the flowrate from the second flowrate to a third flow rate since Christenson teaches adjusting the flow rate. Re claims 5 and 13, paragraph 42 teaches draining the liquid. Re claims 6 and 14, refer to paragraph 14 of Christenson. Re claims 7 and 15, it would have been obvious to the skilled artisan to have modified the method of Christenson to include quick dumping since Christenson in paragraph 42 the desire to remove the processing liquid and further teaches draining the processing liquid. Re claims 8 and 16, refer to paragraphs 14 and 15. Re claim 10, paragraph 46 of Christenson teaches the use of a carrier gas but fails to teach the concentration of the carrier gas. It would have been within the level of the skilled artisan to have determined the amount of carrier gas needed to deliver the cleaning enhancement substance to the substrate surface. Re claim 11, refer to paragraph 69 of Christenson. Re claim 12, Christenson does not

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specifically teach continuing the delivery of the cleaning enhancement substance after the replacing step is complete. However, it would have been within the level of the skilled artisan to do so in order to ensure complete removal of the liquid from the wafer surface and therefore completely dry the wafer surface and the interior of the processing chamber as well. Re claim 17, refer to paragraphs 50 and 52 of Christenson.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ferrell et al. teach a chemical drying and cleaning system. Mehmandoust teaches a method of drying a substrate using polar organic compounds. Kashkoush et al. teach a membrane dryer. Achkire et al. teach a single wafer dryer. Yang teaches an IPA concentration detector.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharidan Carrillo whose telephone number is 571-272-1297. The examiner can normally be reached on M-W 6:30-4:00pm, alternating Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Sharidan Carrillo
Primary Examiner
Art Unit 1746

bsc



SHARIDAN CARRILLO
PRIMARY EXAMINER